

Appropriate models should incorporate 3-dimensional analysis of concentration changes with time past the location where the hypothetical well has been selected. An appropriate pumping rate for the well should then be selected to determine the area of influence from which the exposure point concentrations can be calculated. The errors in the definition of the exposure pathway is severely compounded by the omission of the spatial, temporal and mass information from the calculations.

EPA RESPONSE: The metals, antimony, beryllium, nickel and zinc, are included in the baseline RA.

Estimation of potential risks via use of groundwater from the Upper and Lower zones using current sampling data was deemed appropriate for characterizing this exposure pathway for risk management decisions.

Also see EPA Response to ITT Comment 105 above.

107. (FS Page 1-22) ITT states that the risk assessment correctly notes that lifetime (70 years) cancer risks between  $1 \times 10^{-4}$  and  $1 \times 10^{-6}$  are considered acceptable by US EPA. In fact, the health risks from drinking water, which meets all of EPA drinking water standards (MCLs) can be as high as  $1 \times 10^{-3}$ . The risk assessment notes that the cancer risk for the upper aquifer is higher than  $1 \times 10^{-4}$  and, therefore, it is unacceptable and requires some level of remedial effort. However, as was indicated earlier, the risk assessment provides more information than just the health risk associated with the "no action" alternative. The risk assessment should also identify the material contributing to the health risk and the location of these materials so that these can be addressed by the remedial action plan. Since there are materials contributing to the risk posed by drinking groundwater which do not have MCLs, the remedial objectives must be established by the risk assessment. The FS incorrectly interprets the results of the risk assessment and incorrectly uses MCLs to support the remedial objectives. Rather, the risk assessment should be used to determine the remedial objectives and the remediation goals.

The FS notes that benzene and methylene chloride are not widely distributed in the SP. Yet, these are the two materials which drive both the cancer risk and the non-cancer risk in the upper aquifer. Benzene and methyl chloride contribute over 90% of the total risk, while TCE and PCE, which are used by EPA to design the remedial system, contribute only 1% of the total risk. TCE and PCE pose a health risk of between  $5 \times 10^{-5}$  and  $1 \times 10^{-4}$ , which is the acceptable range, as noted above and as cited in the report. The report further discounts the need for any treatment on either benzene or methylene chloride based on their limited distribution. The correct decision would have been to focus on these two materials as they are the materials driving the risk assessment.

Further example of the improper interpretation of this risk

assessment into the remedial plan is evidenced by the review of arsenic, a naturally occurring substance in the SFV. Arsenic contributes more to the total cancer risk than either TCE or PCE, yet it is also excluded from consideration in the remedial plan. This is very significant as arsenic will not be remediated or reduced by any of the proposed remedial actions for TCE and PCE. The same pattern is true for the cancer risk as estimated in the report. The three materials driving the non-cancer risks are naphthalene, benzene, and methylene chloride. Again, neither TCE nor PCE are significant contributors and the non-cancer risk from these two materials is unacceptable.

ITT believes that the risk assessment makes several critical errors which are likely to grossly overestimate risk. The risk assessment does not attempt to estimate actual concentrations in the plume and to then model these to an exposure point. Rather, the risk assessment omits any spatial, mass or temporal information by simply taking the average and 95% UCL of the well data as representative of concentrations in the plume. It further assumes that these concentrations do not change with time. Aside from dramatically overestimating the actual exposures, this process loses any information on locations which are of greatest concern.

To rectify this omission, the FS attempts to identify those materials which are most "prevalent" and to design a remedial program to minimize their further distribution. To focus on prevalence and/or distribution is incorrect. CERCLA mandates health driven remedial actions, not prevalence driven remedial actions. The health risks posed by TCE and PCE are acceptable and they are not significant contributors to the total risk. This selection process ignores the materials causing both the cancer and the non-cancer risks while mis-selecting TCE and PCE, which do not contribute significantly or pose unacceptable risks as the targets of the remedial efforts.

ITT further states that this remedial strategy is incorrect. Remediation should be focused on the benzene, methylene chloride and naphthalene at the source-specific locations. Of additional concern is the lack of focus on arsenic and the other metals which were incorrectly omitted from the risk assessment. These metals are refractory to the treatment process proposed in the report and arsenic alone presents greater risk than TCE and PCE. If the other metals were included as they should have been, the resulting risk could be significant and the entire treatment scheme would likely need to be revised.

EPA RESPONSE: The decisions represented in this RA are conservative, but not unrealistic. The exposure assumptions, modeling concentration estimates, and exposure equations are all standard recommended elements of current USEPA guidance for Risk Assessment at Superfund Sites (USEPA, 1989) and the EPA Exposure Factors Handbook (USEPA, 1989). The cumulative effort of this conservative approach is inherent in the guidance methodology as

currently written. This RA has not exceeded the guidance. The conservative approach is designed to ensure adequate characterization of potential human health risks. In addition, risk estimates for average concentration levels are provided for use by the risk manager in remediation decision-making and were discussed in the evaluation section of the Glendale RI in order to assign significance to the risk values calculated.

Furthermore, as described in EPA Risk Assessment guidance, remedial action will generally be warranted where exposure is associated with groundwater contamination that exceeds MCLs.

In addition, see EPA Responses to ITT Comments 2, 86, 105 and 106.

108. (FS Page 1-24) The occurrence of bis(2-ethylhexyl)phthalate should be addressed, and its common occurrence as a laboratory or sampling artifact should be addressed. The FS asserts, "[t]he magnitude and toxicity of TCE indicate that this compound is a primary contributor to the carcinogenic and non-carcinogenic risk by ingestion and inhalation of groundwater in the upper zone." ITT asserts that this statement is not true and is not substantiated by the risk assessment. To the contrary, according to the risk assessment, TCE is a minor contributor to both the total carcinogenic and non-carcinogenic risks.

The FS also states that "[w]hile other compounds may contribute to risk calculated for the South Plume area, these compounds were detected only at specific industrial sites and were not prevalent throughout the South Plume area." In fact, other compounds contribute more than 100 times the cancer risk than does TCE and the risk from TCE is acceptable. The opportunity for focused, cost effective remediation of those specific industrial sites should be seriously considered; such an approach may also reduce the overall risk in the SP to acceptable levels.

EPA RESPONSE: See EPA Response to ITT Comment 107.

109. (FS Page 1-25) The conclusions implicate the Glendale Study Area Upper Zone as the source of contaminants to the Lower Zone. It appears that potential source(s) also may be upgradient of the Glendale Study Area and should be taken into consideration in the Feasibility Study.

EPA RESPONSE: While it is recognized that upgradient sources of VOC contamination exist, the potential for the Upper Zone to be a source of contamination to the Lower Zone is significant.

110. (FS Page 2-1) The FS focuses on the contaminated groundwater in the Upper Zone of the South Plume aquifer. The feasibility study does not consider source removal in the vadose zone. Source removal will be an important and major consideration for groundwater treatment design in that sources will continue to

contribute chemicals to the groundwater. Removal of sources must be considered in the remedial objectives of the basin to adequately address the problem and should be considered in the development of appropriate remedial alternatives.

EPA RESPONSE: See EPA Response to ITT Comment 86.

111. (FS Page 2-2) The compounds of concern are discussed in regard to the prevalence of the chemicals in the South Plume. The prevalence evaluation is based on four RI/FS monitoring wells and data from three sites, which are presently monitoring the shallow aquifer. This is an inadequate data set from which to make assumptions regarding the distribution and prevalence of chemicals in the aquifer for an area of more than 620 acres.

EPA RESPONSE: Prevalence evaluation was based on wells located on specific industrial sites as well. An informed risk management decision regarding the area-wide groundwater contamination was made on the basis of an area-wide interpretation of the geology, hydrogeology, and hydrology; the nature and extent of contamination; and the factors affecting the fate and transport of contaminants in the soil-water matrix. Although this interpretation may not be sufficient to address source control issues, it is sufficient for evaluating remedial alternatives that affect area-wide contamination.

112. (FS Page 2-3) The list of chemicals of concern does not discuss the potential of any of these chemicals being present due to laboratory contamination, as is often the case with phthalates. The concern of not addressing the risk drivers has already been raised in these comments and are incorporated again here.

EPA RESPONSE: Phthalates are not the primary compounds of concern as stated in the South OU FS (Page 2-3).

113. (FS Page 2-5) A number of conclusory statements are made regarding various standards which will need to be met, yet are not necessary, accurate, or consistent with other statements made. For example, it is not clear that blending is included in several alternatives, yet the text suggests a nitrate level without reference to blending.

EPA RESPONSE: Blending is discussed in more detail in Section 4.5 of the South OU FS, including nitrate levels that will be obtained by this process.

114. (FS Page 2-7) The FS states that if reinjection is planned, the groundwater will need to be treated to current MCLs, but does not take into consideration the risk assessment. Risk assessment models will more likely assess a higher clean up standard based on risk models of exposure.

EPA RESPONSE: In this case, it is expected that the ARARs (i.e.,

MCLs) will drive treatment standards for reinjection.

115. (FS Page 2-7) Again, the FS states that the MCLs must be met in order to dispose of the treated groundwater through recharge or reinjection. The levels are set by the RWQCB Basin Plan (1975) which establishes the Data Quality Objectives for the San Fernando Basin. The objectives are impractical in light of the basinwide contamination issues, and a more cost-effective and pragmatic method of establishing clean up levels needs to be considered in a basinwide management program.

EPA RESPONSE: See EPA Response to ITT Comment 114 and Section 10 of the ROD.

116. (FS Page 2-8) The potential management and/or institutional actions described in the FS did not include the basinwide management of the groundwater contamination within the San Fernando Valley. The potential presence of DNAPL, the basin configuration, regional groundwater flow direction and other factors warrant consideration of basinwide management. Basinwide management of the problem should be considered instead of fragmenting the basin into operable units which may not be the most technically advantageous or cost-effective approach.

EPA RESPONSE: See EPA Response to ITT Comment 87 of the Glendale North OU Responsiveness Summary (attached).

117. (FS Page 3-2) It is stated that lining of the Los Angeles River in the unlined portion is not considered administratively feasible. This administrative infeasibility should be adequately justified; if this option is not infeasible, it should not be removed from consideration.

EPA RESPONSE: Lining of the Los Angeles River where it is currently unlined is both technically and administratively infeasible.

118. (FS Page 3-3) In situ well treatment technology is not considered under physical treatment in Table 3.1-1. An example of such a system is the vacuum vaporizer well (UVB), which incorporates in-well air stripping technology and would not create the groundwater disposal issues associated with scenarios that involve pump and treat at the ground surface. The UVB and similar technologies have been shown to effectively treat groundwater for VOCs with numerous successful case studies in Europe and new installations in the United States.

EPA RESPONSE: Although UVB systems may be applicable for source control applications, this technology is not applicable for large-scale, area-wide remedial action as it has a limited radius of influence.

119. (FS Page 3-3 and Table 3.1-1) Upgradient flushing is listed

as a considered process option. This technology was eliminated on the basis of lack of information on sources which would make a determination of the upgradient reinjection area difficult. However, despite this lack of knowledge of source areas, EPA's contractor has identified well extraction scenarios for the GSA. For optimal locations of extraction wells for aquifer remediation and to avoid further detriment to the aquifer, knowledge of the sources in the area is necessary before siting the extraction wells.

EPA RESPONSE: See EPA Response to ITT Comments 86 and 87.

120. (FS Page 3-5) Again, the FS did not evaluate in situ physical groundwater treatment technology. The FS has selected the alternative pump and treat without consideration of potentially more efficient, cost-effective measures.

EPA RESPONSE: Although in situ treatment technologies may be applicable for source control, these technologies are generally not applicable for large-scale, area-wide remedial action as they have a limited radius of influence.

121. (FS Page 3-6) If an alternative such as in situ air stripping were chosen, the right-of-way (ROW) acquisitions and issues would be minimal, compared with the more conventional pump and treat technology with its associated piping and structures. With in situ air stripping, conveyance pipelines and their associate ROWs would not be necessary.

EPA RESPONSE: See EPA Response to ITT Comment 120.

122. (FS Page 3-7) The FS eliminates injection wells based on the assumption that groundwater levels increase near the Los Angeles River, resulting in a loss of groundwater to the river. No evaluation of the actual injection well locations or modeling of the impact is provided for review in the Feasibility Study. In addition, other disposal options are being considered which would result in a non-consumptive use which is inconsistent with basin-wide planning goals.

EPA RESPONSE: Preliminary modeling used for extraction scenario evaluations showed that groundwater flows to and from the Los Angeles River were very sensitive to water table elevations. Based on an understanding of the increase in head necessary for reinjection, it was determined that the piezometric surface would rise such that an increase of flow towards the river would occur, resulting in a loss of groundwater to the river. Modeling data is included in the Administrative Record for Glendale South.

123. (FS Page 3-9) Contrary to what the FS states, conventional pump and treat technology is not the "most practical, proven and cost-effective extraction process." Newly available technologies, such as the UVB "in-well air stripper," and practical management

considerations, such as a treatment at the point-of-use, should be considered, as discussed elsewhere in this document.

EPA RESPONSE: See EPA Response to ITT Comment 120.

124. (FS Page 3-9) Pump and treat alternatives are undergoing increasing scrutiny due to their lack of achieving cleanup levels and, contrary to the feasibility study, pump and treat alternatives can be very costly and time-consuming without reaching cleanup levels. There are no documented sites with chlorinated VOCs which have successfully reached and maintained cleanup levels using pump and treat systems. The few sites that have reached these levels have shown documented rebounds in VOC contamination after the pumps have been turned off. In addition, due to the heterogeneity of the aquifer materials and potential of DNAPL at sites within the South Plume, pump and treat is not necessarily a practical or a cost-effective action for aquifer restoration. It can, however, be considered as part of an overall groundwater management scenario.

EPA RESPONSE: As stated on Page 2-4 of the South OU FS, "Because the remedial action established by the South OU ROD will be an interim action, chemical-specific requirements to be met in the aquifer at the end of the final remedy will not be ARARS for this OU, but will be addressed as part of the basin-wide RI/FS."

Also see EPA Response to ITT Comment 86.

125. (FS Page 3-10) An on-site carbon regeneration plant should be considered, as it may be more cost-effective. Management of the carbon system for optimal sorption capacity needs to be addressed.

EPA RESPONSE: Although off-site regeneration of carbon was assumed for cost estimating purposes in the FS, on-site regeneration can be considered for the selected remedial alternative during the design phase.

126. (FS Page 3-10) Treatment of radioactive species is evaluated as a part of liquid phase GAC treatment. Radon was detected above the proposed MCL of 300 pCi/l in three well completions, which included the deeper cluster wells. Radon naturally occurs throughout the San Fernando Groundwater Basin due to the erosion of granitic source rocks from which the sediments were derived. In addition, the radon levels observed in the wells, when blended with the groundwater with concentrations observed in wells below MCLs, may not pose any risk. These issues were not adequately addressed in the FS. In addition, the discussion did not address whether special handling is required for other GAC systems presently operating in the basin.

EPA RESPONSE: See EPA Response to ITT Comment 83.

127. (FS Page 3-11) An alternative with resin should not be dismissed simply because treatability studies may be required.

Treatability studies often are necessary for proven technologies.

EPA RESPONSE: The detailed costs for alternatives include some costs for treatability studies for all of the technologies carried through detailed analysis. Technologies were not eliminated based solely on the need for treatability studies. However, because the remedial action for this OU is an interim action and includes high flow rates, the FS primarily evaluated technologies that had been implemented at large scale (greater than 1 mgd).

128. (FS Page 3-14) Rotary air stripper and hydraulic jet air stripper technologies appear to have been eliminated based on probable cost and not actual calculated costs. We believe costing should have been completed on viable options to make unbiased comparison of the various technologies. The disadvantages of packed-tower air strippers should be discussed and compared before eliminating the newer technologies in the Feasibility Study.

EPA RESPONSE: A detailed analysis of costs is presented in Sections 5.0 and 6.0 for those technologies that were carried through alternative development. The cost estimates have an accuracy of +50 percent to -30 percent, as required by the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (USEPA, 1988). Detailed cost analysis is not required for technologies that are not carried through detailed analysis.

129. (FS Page 3-22 through 3-31) Nitrates and TDS concentrations measured in the groundwater of the San Fernando Valley are above their respective MCLs throughout the basin in the water table aquifer. These compounds were contributed by sources not related to current industrial practices in the valley, and are ascribed to previous agricultural activities and non-industrial septic systems. The levels of TDS are generally high in the shallow groundwater of the basin; agricultural activities in the basin would have contributed to the TDS levels. Nitrates are also believed to have been derived from agricultural activities and septic systems prior to installation of sewer systems in the valley. As these constituents are a pre-existing background condition and are extremely expensive to treat, potential responsible parties should not have to treat groundwater to remove them. Blending provides an economical solution, and this option already has been accepted in the Burbank ROD.

EPA RESPONSE: Blending has been included in the South OU FS and has been carried through detailed analysis.

130. (FS Page 3-22 through 3-31) Numerous technologies are proposed for the removal of nitrates. These technologies appear to have been evaluated using different criteria than those used for the organic compounds, in that impractical and difficult treatments are evaluated in great detail and considered for nitrate removal. It is unclear why the depth of information is provided only for these options, when blending is the recommended alternative. All

the technologies should be evaluated using the same selection criteria to make decisions on the remedy selection.

EPA RESPONSE: The same selection criteria, effectiveness, implementability, and estimated costs, were used to evaluate both VOC and nitrate treatment options. Detailed descriptions of the potentially applicable technologies for VOC and nitrate treatment are provided in Section 3.0 of the Glendale South FS.

131. (FS Page 3-32) As directed, to meet the Basin Plan (1975) for the San Fernando Valley the treated water should be blended to meet the inorganic requirements. In addition, should a reinjection option be implemented by the EPA, variances should be considered for the reinjection treated water as a cost-effective measures, followed by treatment of groundwater further downgradient at the point-of-use.

EPA RESPONSE: Recharge of groundwater treated for VOCs with and without prior treatment for nitrates are included as disposal options in the alternatives developed in Section 5.0 of the Glendale South FS.

132. (FS Page 4-1) The additional cluster well proposed to monitor groundwater contamination in the Upper Zone and the Lower Zone of the South Plume area would bring the number of wells to be used to assess the areal extent of chemicals to five in the Upper Zone, and four in the Lower Zone. This well coverage is sorely inadequate to address either the chemical distribution or groundwater flow characteristics within the water-bearing zones of the South Plume area, which cover approximately 620 acres. Additional information should be incorporated from the known industrial sites, and additional source sites within the South Plume should be identified to incorporate any new well data to better assess the nature of chemicals in the South Plume.

EPA RESPONSE: Other locations and additional monitoring can be considered during the design phase of the interim remedy. The proposed location of Well P-1 was intended to monitor downgradient contaminant migration.

133. (FS Page 4-2) ITT asserts that the well monitoring network proposed to monitor the clean up of the aquifer is highly inadequate. Not only are there insufficient wells to adequately assess the distribution of chemicals in the South Plume Area, but insufficient hydraulic information has been collected to date to make assumptions about the effectiveness of the monitoring system.

EPA RESPONSE: See EPA Response to ITT Comment 132.

134. (FS Page 4-5) The FS assumes that an NPDES permit would be required and that all requirements for the permit would need to be met at time of recharge to the Headworks Spreading Ground. These are not necessarily accurate assumptions, and do not allow for a

negotiated variance to the Basin Plan which has been implemented at other sites.

The compounds of concern for the FS are those that are the most prevalent within the samples collected from the severely limited number of monitoring wells for the South Plume. Numerous other compounds were detected, but do not have promulgated MCLs. As a result, these compounds are not considered further in the Feasibility Study as part of the treatment alternatives. In addition, toxicological or exposure risks for these chemicals are not presented. All chemicals in the aquifer that could impact the treatment technologies as well as future use of the treatment groundwater should be considered.

EPA RESPONSE: Permits will not be required for actions that occur on-site; however, all substantive requirements of permits that would be required for non-Superfund actions will have to be met.

In general, the compounds of concern are those compounds that have been detected above MCLs in the vicinity of the South Plume area. A detailed description of all compounds detected in the South Plume area is presented in the RI Report. The compounds of greatest concern for potential remediation have been carried through the Glendale South FS.

135. (Tables 5-3 and 5-4) in the RI (Summary of Preliminary Screening of All Detected Compounds in Groundwater for the South Plume) show MCLs (or MCLGs) for indicator chemicals such as benzene, toluene, ethyl benzene and xylenes (BTEX). Review of potential remedial alternatives for the FS do not appear to consider all materials contributing significantly to risk from exposure to groundwater as discussed in the RI, and instead of focus on just those exceeding MCLs (or MCLGs). If some of these risk contributing chemical do not have MCLs (or MCLGs), then it is appropriate to use the MCLs to develop remedial objectives and a risk driven remedial objective must be developed for all of the COCs present in groundwater. It is inappropriate to mix both MCLs and risk driven remedial objectives.

EPA RESPONSE: See EPA Response to ITT Comment 86.

136. (FS Page 4-6) No option is provided for beneficial use of the treated groundwater by private or municipal parties. Potential irrigation uses may be appropriate for memorial parks and recreational parks in the area. It is our understanding that, in fact, Glendale has a reclaimed water program, including many different types of usage.

In addition, if in-situ well treatment technologies were considered, the groundwater disposal issues would be limited or non-existent, depending on the scenario.

EPA RESPONSE: As described in Section 4.2.1 (Page 4-4) of the

Glendale South FS, the option of reuse for drinking water supply is a beneficial use.

137. (FS Page 4-6) The groundwater model is not an adequate tool to address groundwater flow characteristics or chemical distribution within the water-bearing zones of the South Plume area based on the present data. Additional information should be incorporated from the known industrial sites and continued identification of additional source sites within the South Plume to incorporate new well data to better assess the nature of chemicals in the South Plume. According to the information provided in the RI, the apparent risk driver chemicals are from 2 industrial sites in the South Plume. At most, at this time, efforts should focus on these sources and not on the larger area.

EPA RESPONSE: The database used in developing the flow model for the Glendale Study Area incorporates all data collected as part of the San Fernando Valley RI as well as other investigations conducted throughout the basin. The 3-D, calibrated, basin-wide, groundwater flow model was used to calculate groundwater flow velocities. The solute transport model developed for the Glendale Study Area simulated contaminant transport in the top layer of the 3-D, basin-wide flow model. Therefore, the contaminant transport model includes the 3-D effects on solute transport. The model was designed to be used as a planning tool only. The next stage of evaluation of extraction options should involve field evaluation of the proposed remedial alternatives. This type of evaluation was outside the scope of the South OU FS.

138. (FS Page 4-6) The impact of the treatment plant location could have significant cost impacts on the extraction scenarios and should be evaluated as part of the scenarios. Further, the feasibility of the site locations should be addressed to determine if in fact treatment systems could be constructed at the proposed locations. As part of the scenarios, the piping corridors were not evaluated in the FS. In addition, the Franciscan Ceramics site is considered a valuable property and has been identified for higher use, including a school site and a location for the new L.A. Police Academy.

EPA RESPONSE: The feasibility of the treatment facility locations is discussed in the Glendale South OU FS Section 4.0. As stated in the FS, the exact location of the treatment facility will be determined during the design phase of the remedial action. Piping corridors were considered during the FS as well. The exact locations of the conveyance system will also be determined during the design phase of the remedy.

139. (FS Page 4-7) The statement is made that pump and treat techniques are effective when the remedial objective is to inhibit further mitigation of concentrated portions of groundwater within the South Plume area. While this statement is valid, the currently existing database and modeling efforts are inadequate to address

these concerns. Furthermore, the modeling scenarios do not take into account the effects of the projected Glendale North OU activities, and this modeling effort will have to be repeated and augmented following the negotiation and subsequent issuance of the Glendale North OU ROD. As a result, the effort to date on the extraction scenarios for the South Plume is of questionable value.

EPA RESPONSE: Because at the time the Glendale South OU FS was prepared a ROD had not been signed for the Glendale North OU, extraction in the Glendale North OU area was not accounted for in the extraction scenarios modeled for the South OU FS (Page 4-12 of the South OU FS). Additional modeling to refine the locations of the extraction wells may be performed during the remedial design phase.

Also see EPA Response to ITT Comment 137.

140. (FS Page 4-7 and Section 4.3) The groundwater model is used to develop and evaluate extraction scenarios and for the Glendale area. The very limited database on which the model is based should not be used to make costly pump and treat decisions. More data are needed before the system is designed and implemented (see Model Discussion).

EPA RESPONSE: See EPA Response to ITT Comment 137.

141. (FS Page 4-9) The scenarios are based on the model, and this predictive tool is only as good as the data used to develop the model. As discussed in Section 1 comments, this model is based on an extremely limited data set, especially the 2-D solute transport model used to generate the scenarios. Additional points should be incorporated as groundwater monitoring data in the area become available at numerous facility investigations, to attempt to fine tune the gross estimates presently being used to evaluate extraction scenarios.

EPA RESPONSE: See EPA Responses to ITT Comments 94 and 137.

142. (FS Page 4-9) Very limited data are used to predict mass volumes in the groundwater and sorbed onto the soil. The estimates do not even consider the potential of separate phase DNAPL and the impact of the presence of DNAPL of TCE or other constituents on the mass calculations. VOC mass estimates would be significantly higher and cost correspondingly higher if DNAPL is present. The model needs to be used as a predictive tool. However, the severe limitations of the model and the input data used to construct the model should be discussed and an estimate of accuracy considered. In addition, the potential of chemical contribution from vadose zone source areas is not considered within the modeling effort.

EPA RESPONSE: See EPA Response to ITT Comments 87 and 137. The limitations and the uncertainties associated with the modeling effort are discussed in detail in Section 4.3.

143. (FS Page 4-9) The TCE and PCE concentrations used in the model were an average of concentrations detected of only a very few samples from the top and bottom of the Upper aquifer in October 1990. No indication has been observed regarding the variability over time of the VOC concentration in samples from the wells and if any temporal trends have been observed in the sampling, primarily because a few wells were sampled only twice, and the remaining ones only once. Generally, several calendar quarters of data are often evaluated to establish trends and identify potential anomalies in the data which may need to be addressed and be accounted for in the modeling effort. This was not done here.

EPA RESPONSE: The initial masses of TCE and PCE were calculated from the contaminant distributions dated September to October, 1990 as shown in Figures 1.2-3 to 1.2-6. The groundwater flow system in the basin is essentially stable over the long term. Furthermore, the current contamination distribution was generated over the long term. Therefore, quarterly monitoring variations in contaminant concentrations have been small and are not expected to significantly impact the results of the modeling effort.

144. (FS Page 4-9) If DNAPL is present in a separate phase then extended cleanup times can be expected. Twelve years of O&M is unrealistically low, and this issue must be addressed in the text.

EPA RESPONSE: See EPA Responses to ITT Comments 86 and 87.

145. (FS Page 4-10) It should be explained why the O&M costs are presented as being estimated over a 12-year operating period, or 15 years from October 1990. Again, this O&M period is misleading short, based on experience at other sites and the potential for DNAPL.

EPA RESPONSE: See EPA Responses to ITT Comments 86 and 87.

146. (FS Page 4-10) A design and operation time of 15 years is specified. Given what is known today regarding pump and treat systems, DNAPL compounds and extended cleanup times, this period may be sufficient to reach the point of diminishing return but not cleanup. A comprehensive groundwater management strategy should have been discussed. This strategy should combine source removal, treatment of the point-of-use, and possible control using the basin configuration, with a comparison of this strategy relative to long term costs of the other operable unit remedies.

EPA RESPONSE: As stated on Page 2-4, "Because the remedial action established by the South OU ROD will be an interim action, chemical-specific requirements to be met in the aquifer at the end of the final remedy will not be ARARS for this OU, but will be addressed as part of the basin-wide RI/FS."

Also see EPA Responses to ITT Comments 86 and 87.

147. (FS Page 4-11) There is no discussion of the impact of other COCs, especially in light of the fact that they seem to have greater risks according to the RI.

EPA RESPONSE: See EPA Responses to ITT Comments 86 and 87.

148. (FS Page 4-12) The FS discusses the potential impact of a ROD for the North Plume area and the subsequent effects of pump and treat systems on the South Plume area. The potential decrease in water levels "may be beneficial in reducing groundwater flow and contaminant transport out of the aquifer to the river in the South Plume area." The impact of a North Plume pump and treat system will impact the model results including the extraction scenarios and alternative decisions.

Based on the results of the RI South Plume risk assessment (Section 8), chemicals including benzene, methylene chloride, 1, 1-dichloroethene, vinyl chloride and arsenic (which were risk drivers) should be considered when selecting remedial alternatives for the South Plume site. The inappropriate elimination of detected COCs from evaluation in the FS and from the scope of remedial activities could exclude potential PRPs and may create undue and unnecessary costs and efforts for the identified PRPs.

EPA RESPONSE: See EPA Responses to ITT Comments 86, 87 and 141.

149. (FS Page 4-12) A limited discussion is provided on the Burbank OU; however, the Burbank OU mass contribution and its associated impact on the Glendale Study Area is not included. Therefore, it is not possible to determine whether information on the Burbank OU might be relevant in evaluating this SP OU.

EPA RESPONSE: The effects of pumping in the Burbank Operable Unit were considered as well (Page 4-12). Delays, shut downs, and variable pumping would impact the system on the short-term and should not influence remediation over the long-term as long as the system is properly designed.

150. (FS Page 4-12) No mention was made in the Feasibility Study of the site within the South Plume area that currently may be conducting pump and treat activities. Historically, the Philips Components site (Centralab) had operated a groundwater extraction and treatment system. The potential impact of this activity should be included and discussed.

EPA RESPONSE: The total extraction rate at the Philips Components site is less than 100 gpm and is not expected to impact groundwater movement on an area-wide basis.

Also see EPA Responses to ITT Comments 86 and 87, and EPA Response to Comment 28 in Part I of this Responsiveness Summary.

151. (FS Page 4-14) The extraction wells were located based on

the areas of higher concentrations of TCE; these areas do not always correspond to other chemical "highs". If the other chemical sources are to be addressed on the localized level, then this rationale should be stated in the Feasibility Study and the effects included in the modeling effort.

EPA RESPONSE: See EPA Responses to ITT Comments 94 and 137. The exact locations of extraction wells should be determined during the design phase of the remedy.

152. (FS Page 4-14) Extraction rates of 2,000 to 3,000 gpm are assumed achievable "despite limited information regarding sustainable extraction rates" for the South Plume area. The extraction rates are based on yields in the Pollock wellfield downgradient of the South Plume Area, even though data are not presented showing the correlation of the aquifer material. In addition, the Pollock wellfield is located on the opposite side of the Raymond Fault and appears to have different geological conditions (Technical Memorandum for the Phase 1 Pollock Cluster Wells). This information should be presented and discussed in the Feasibility Study. Furthermore, aquifer tests should have been conducted prior to expending the effort to model the various scenarios.

EPA RESPONSE: See EPA Responses to ITT Comments 94 and 137. The exact locations of extraction wells and rates of extraction per well will be determined during the design phase of the remedy.

153. (FS Page 4-15 to 4-31) The extraction scenarios do not include in-situ treatment wells as an option which would target mass removal and alleviate the water disposal problems. This option would eliminate some of the ROW costs and considerations because the volume of water disposal would be greatly reduced. This assumes the scenario would be used in conjunction with a basin-wide management plan and would include treatment at the point-of-use.

EPA RESPONSE: Although in situ treatment technologies may be applicable for source control, these technologies are generally not applicable for large-scale, area-wide remedial action as they have a limited radius of influence.

154. (FS Page 4-15 to 4-31) The various extraction scenarios are discussed and the estimates of the mass of VOC removal over time are predicted using the model, along with the decrease in concentration at the extraction well. Assuming that the scenarios are correct (which they are not), it would be more prudent to evaluate the efficiency of the mass removal over time and compare the relative mass removal to cost ratio for each scenario than to attempt to predict the cost of a 12-year cleanup program. Cost efficiency may be recognized with other than standard technologies to provide greater initial mass removal and then reevaluate the system and make further assessment as to the need for further